

## **805 KAR 2:010. Underground coal mine usage.**

RELATES TO: KRS 352.050(1)

STATUTORY AUTHORITY: KRS 352.050(1), 351.070(13)

NECESSITY, FUNCTION, AND CONFORMITY: This administrative regulation is to permit the use of diesel powered equipment in underground mines for the purpose of reducing the number of electrocutions and mine fires from electrical cables.

Section 1. General Requirements for the Use of Diesel Equipment. (1) Only diesel equipment bearing approval plates of permissibility issued by the Federal Mining Enforcement and Safety Administration and approved for use by the Kentucky Department for Natural Resources will be allowed in underground coal mines of the State. No diesel powered machinery may be taken into any underground coal mine of the State of Kentucky without the written approval of the Commissioner of Mines and Minerals. The approval for use shall incorporate all the requirements of these administrative regulations. If at any time the commissioner determines that any condition or practice permitted under this approval may threaten the health or safety of the employees, he may impose additional requirements for the purpose of eliminating the condition or practice.

(2) If technical, scientific or engineering information is gained indicating that approved diesel machinery may be used in a manner which will afford workmen equal or greater protection than afforded by the provisions of these administrative regulations, the commissioner may approve the use of the machinery in the manner which provides equal or greater protection.

(3) Mining Enforcement and Safety Administration approval of the permissibility of mobile diesel powered transportation equipment (hereinafter referred to as diesel machine(s)) means only that the particular machine has met certain specific requirements of design and performance, but such approval does not guarantee that it is impossible to use a permissible machine in an unsafe manner. The manufacturer must develop equipment that will meet the particular requirements for approval, but it is the user's responsibility to see that the equipment is maintained in permissible condition and is used in a permissible manner. In addition to proper maintenance, the use of diesel machines underground involves certain other factors, such as ventilation, which are of equal importance in establishing safe operating conditions. It is absolutely essential to observe the requirements of these administrative regulations in operating and maintaining such machines to avoid impairing their permissible status and thus defeat the protective features that are necessary for their safe use.

(4) Engine adjustments shall be verified by the manufacturer as being correct before each permissible diesel machine is operated in a coal mine.

(5) Alteration in design, substitution of components or subassemblies, or changes in conditions of operating permissible diesel machines shall not be made without prior concurrence of the Kentucky Department for Natural Resources and the Mining Enforcement and Safety Administration. When such changes are permitted additional engine tests and adjustments shall be required as necessary to ensure the safe operation of the particular machine in a coal mine.

Section 2. Proper Ventilation to be Maintained for the Mines in Which Diesel Powered Equipment is Used. (1) The use of diesel machines underground shall be restricted to haulageways and working places where positive (controlled flow) ventilation is maintained.

(2) The ventilating air in all mine workings where diesel machines are operated shall not contain combustible or other contaminating gases in such concentration that will affect combustion in the diesel engine by materially increasing production of toxic (poisonous) or other objectionable constituents in the engine exhaust.

(3) Each set of producing entries in which diesel powered equipment is used shall be placed on a separate split of air.

Section 3. In mines using diesel powered equipment the quantity of ventilating air must meet the following standards:

(1) In addition to the amount of air required by the Kentucky Mining Law, at least 6,000 cubic feet of air per minute shall be provided for each diesel unit used in a working section of a mine. The air measurement shall be taken in the last open entry crosscut. If these locations cannot be used due to pillaring, the measurements shall be taken at the intake and return of the section. The quantity of ventilating air shall be adequate to dilute the toxic and/or objectionable constituents of the engine exhaust so that the composition of the air in each haulageway and working place connected thereto will meet authoritative standards for safe healthful working environment.

(2) The minimum quantity of ventilating air that must be supplied for a permissible diesel machine in a given time shall conform to that shown on the approval plate attached to the particular machine.

(3) The quantity of ventilating air in mine workings where diesel machines are operated shall be measured once during each working shift and a record of each measurement shall be kept in a book provided for this purpose.

(4) No person shall incorporate any device in the exhaust system of a permissible diesel machine that has not been approved in the tests that determine the permissibility of the machine.

Section 4. Maintaining Proper Quality Air in Mines that Use Diesel Powered Equipment. (1) The air supplied for ventilation where diesel machines are used in coal mines shall contain not less than twenty and five-tenths (20.5) percent, by volume, of oxygen (dry basis) and not more than one (1.00) percent, by volume, of methane.

(2) The ventilating air in working places where diesel machines are operated shall be sampled and analyzed chemically often enough to assure that the composition of the engine intake air conforms with requirements stated in subsection (1) of this section and that the concentrations of contaminants, such as carbon dioxide, carbon monoxide, and oxides of nitrogen, when added to the ventilating air by the diesel-engine exhaust shall meet authoritative standards for safe healthful working environment.

(3) Ventilation and machine-operating conditions shall maintain the composition of the air in the pertinent mine workings so that the tolerable limits stated in subsections (1) and (2) of this section will not be exceeded.

(4) Diesel-engine exhaust shall not contain black smoke.

(5) When the conditions of the quality of air stated in subsections (1), (2), and (3) of this section are not maintained, as determined by analysis or other observation operation of diesel machines shall be stopped until the requirements of air quality are complied with.

(6) Records shall be kept of all air analyses and of any changes(s) in ventilation or diesel engine adjustment resulting from the analyses.

Section 5. Maintenance of diesel machines to be maintained according to the following rules:

(1) The maintenance of diesel machines in permissible condition shall be delegated only to authorized, competent persons.

(2) Engine intake and exhaust systems shall be inspected visually at least once each working shift. Other diesel machine components shall be inspected in accordance with instructions of the manufacturer. Records shall be kept of the inspections.

(3) Maintenance, inspection and repair work shall be done in accordance with instructions of the manufacturer. Records shall be kept of maintenance, inspection and repair work.

Section 6. The Maintenance of the Engine-fuel-injection System. (1) Injection values.

(a) Injection values shall be maintained in proper operating condition. Particular attention shall be

given to preventing imperfect atomization or distribution of the fuel.

(b) Replacements of worn or broken injection valves shall be identical with those on the engine when the diesel machine was approved as permissible.

(2) Fuel pump.

(a) The engine fuel pump shall be sealed or locked to prevent tampering. The seal shall be broken only by an authorized competent person, when necessary to reset the fuel pump, after which the pump shall be resealed.

(b) Resetting of the stop limiting maximum fuel injection of the fuel pump shall be identical with the original setting provided by the manufacturer.

(c) Each shop or facility in which diesel engines are serviced shall be provided with equipment for properly measuring the quantity of fuel delivered by the fuel pump when operating at maximum fuel setting, or such adjustments shall be made only by a competent diesel service organization where such equipment is available.

(d) The fuel pump shall be set to deliver the maximum weight of fuel specified in the certifications provided by the Mining Enforcement and Safety Administration and the Kentucky Department for Natural Resources.

(e) When operating a diesel engine at altitudes exceeding 1,000 feet above sea level, the maximum quantity of fuel injected by the fuel pump shall be set in accordance with the liquid fuel rate-altitude table provided in the manufacturer's caution statement.

Section 7. The Procedures to Follow in Inspection and Maintenance of Engine-intake System. (1) The engine-intake system including flame arrester(s), air cleaner, and all joints shall be inspected at intervals according to the manufacturer's general maintenance instructions.

(2) Inspection of the engine-intake system shall include tightness of all joints and cleanliness of flame-arrester surfaces.

(3) Periodic measurements shall be made of the vacuum in the engine-intake system to determine whether the air cleaner and flame arrester(s) require cleaning.

(4) The air cleaner of the engine-intake system shall be maintained in accordance with the manufacturer's instructions. The normal oil-filling level shall not be exceeded.

Section 8. When and How to Inspect and Maintain the Engine-exhaust System. (1) The engine-exhaust system, including flame arrester(s), conditioner or cooling boxes, shutoff mechanism, water spray, and exhaust-dilution system shall be inspected at intervals according to the manufacturer's general maintenance instructions.

(2) Periodic measurements shall be made of the positive pressure in the engine-exhaust system to determine whether the exhaust flame arrester requires cleaning.

(3) The water supply for the exhaust-gas cooling system shall be replenished by an authorized person at the beginning of each working shift.

(4) When salts from the evaporation of water in the exhaust-gas cooling system are deposited on auxiliaries, such as cooling boxes, conditioners and other parts of the system, such auxiliaries shall be flushed with water and cleaned to remove the salt deposits, as well as soot filtered from the exhaust gas.

(5) Float valves shall be serviced at intervals according to the manufacturer's instructions to maintain them in good operating condition.

(6) Functioning of the fuel shutoff mechanism actuated by the exhaust-gas temperature, shall be tested at least once every three (3) months. This test shall be made in a safe place; not in active face workings of a coal mine.

(7) All heated surfaces of the diesel engine shall be inspected and cleaned at intervals frequent enough to ensure that such surfaces are kept free of combustible materials, such as coal dust, die-

sel fuel, lubricants, and rags or waste.

(8) The exhaust-gas dilution system shall be inspected and cleaned at intervals frequent enough to ensure safe dilution of the exhaust gas when it is discharged from the diesel engine.

(9) Whenever the diesel-engine exhaust is smoky or objectionable odors are emitted in the exhaust, the cause shall be investigated immediately and corrected in accordance with the manufacturer's instruction.

Section 9. The Use and Maintenance of Electrical Components of Diesel Equipment. (1) Locks and seals. Electrical parts, such as battery boxes and headlights, shall be provided with locks and seals that are maintained where required to preserve the permissible status of a permissible diesel machine.

(2) Fastenings. Joints in motor casings, starting switch enclosures, headlights, and other parts that are subject to arcing during normal operation shall be fastened securely. All bolts, cap screws, and other means of joining parts of casings and enclosures shall be kept in their proper places and secured tightly.

(3) Wiring and conduit.

(a) Wiring insulation shall be maintained in good condition and when worn or abraded shall be replaced with well-insulated wiring.

(b) Rubber hose, steel pipe, and other types of conduit for wiring shall be supported firmly at each end and between ends when the lengths are such as to require additional support. Conduit and other means of protecting wiring shall be kept in place and maintained in condition equivalent to that provided by the manufacturer for the permissibility tests.

(4) Headlight and instrument lenses. Lenses forming part of the explosion-proof casings of headlights or enclosures of instruments shall be held securely in place. Cracked lenses shall be replaced immediately.

(5) Overload and short-circuit protection. Tampering with fuses, relays or other means supplied by the manufacturer for overload and short-circuit protection of wiring and electrical parts shall not be permitted, nor shall the use of substitutes that nullify such protection be permitted.

(6) Battery. Battery-cell tops shall be maintained free of electrolyte and other foreign material. Connections between battery cells shall be kept tight and free of corrosion.

Section 10. Fuel Usage in Diesel Powered Equipment. (1) Specifications.

(a) The fuel for diesel engines of machines approved for service in underground mines shall conform to the equipment manufacturer's specifications for viscosity, pour point, cetane number, carbon residue and water. The flash point shall be not less than 140 degrees Fahrenheit, and the sulphur contents shall not exceed five-tenths (0.5) percent by weight.

(b) Only distillate fuel shall be used in engines of permissible diesel-powered transportation equipment for underground mines.

(2) Storage and handling.

(a) Fuel taken underground shall be transported only in strong, tight metal containers that are provided with efficient closing devices.

(b) The quantity of fuel stored underground shall not exceed that required for twenty-four (24) hour operation of all diesel machines in use.

(c) Fuel taken underground and awaiting transfer to diesel machine fuel tanks shall be stored in a closed compartment, constructed of incombustible materials, and shall be kept in a well-ventilated location, the return air from which shall not pass through any active mine workings.

(d) The walls of a fuel-storage compartment shall form a liquid tight joint with the bottom of mine floor. Any opening in the fuel-storage compartment, such as a doorway, shall be provided with a sill high enough to form a catch-basin in the storage compartment to retain spilled fuel. The capacity of

the catch-basin shall be large enough to hold the maximum quantity of fuel that is permitted to be stored underground.

(e) Diesel machine fuel tanks shall be filled only at the fuel-storage compartment. Fuel shall be transferred from the storage compartment to a machine fuel tank through flexible hose that is fitted with a self-closing valve.

(f) The fuel-handling system and the diesel machine shall be frame grounded when fuel is being transferred from the storage compartment to the machine fuel tank.

(g) The air vents on fuel-handling equipment shall be flameproof.

(h) When fuel is being transferred from the storage compartment to the machine fuel tank, the diesel engine shall be stopped.

(i) A supply of sand or other suitable incombustible material shall be available during the transfer of fuel from the storage compartment to the machine fuel tank for absorbing spilled fuel.

(j) All drain plugs in the fuel-handling system shall be threaded and sealed or locked in the closed position to prevent unintentional opening.

(k) Only trained authorized persons shall be permitted to handle fuel for diesel machines.

(l) In fuel-handling operations, precautions shall be observed to keep the fuel clean and free from contamination by foreign material, such as dirt, sediment and water.

(m) Fuel filters on diesel engines shall be cleaned regularly and repaired promptly as conditions require.

Section 11. Types of Fire Extinguishers Used and their Storage. Liquid carbon dioxide or pressurized dry-chemical fire extinguishers shall be installed at underground repair shops, machine barns, and fuel shortage compartments.

Section 12. Maintenance of Underground Repair Shops and Machine-storage Barns. (1) Ventilation.

(a) Underground repair shops and diesel machine-storage barns shall be ventilated by a separate air split between the intake and return airways.

(b) When diesel machines are operated in underground repair shop or storage barn, or in the event of fire, arrangements shall be made to conduct the products of combustion therefrom directly to the return airway.

(2) Construction.

(a) Underground repair shops and machine-storage barns shall be lined with nonabsorbent, incombustible material. Doors to other means of closure shall be constructed of similar incombustible material.

(b) Floors of underground repair shops and machine-storage barns shall be impervious to oil and shall be so graded as to provide natural drainage to a sump or catch-basin to collect spilled oil.

(c) Spilled oil shall be cleaned up and removed from the sump or catch-basin promptly and stored in closed metal containers until disposed of on the surface.

(3) Repair operations. Welding or other operations that might create a fire hazard shall not be done unless precautions are observed to prevent inadvertent ignition of diesel fuel or lubricants.

(4) Miscellaneous. A supply of sand or other incombustible material shall be kept in underground repair shops and machine-storage barns to aid in firefighting and to absorb spilled diesel fuel or lubricants.

Section 13. General Conditions Governing the Operation of Diesel-powered Equipment in Underground Mines. (1) The operation of diesel equipment in underground coal mines in Kentucky shall be under the supervision of a foreman holding a Kentucky Mine Foreman Certificate.

(2) Not more than two (2) diesel shuttle cars will be permitted to operate at the same time in a

single air split. Provided, however, that the Commissioner of Mines and Minerals may if he determines that the safety or health of the employees will not be jeopardized, permit additional shuttle cars to be used.

(3) No diesel equipment will be permitted to operate in any section of a mine where room entries exceed 3,000 feet in depth.

(4) The engine of a shuttle car shall be shut down at all times when not in use (that is, it must not be allowed to idle more than absolutely necessary).

(5) If the engine exhaust becomes more noticeable than normal, the equipment shall be removed from the faces and shut down until the proper repairs can be made to correct this condition.

(6) All employees working in sections where diesel equipment is used shall be furnished with self-rescue respirators which they shall carry at all times while on duty in the mine.

(7) No person who works in close proximity to mobile diesel equipment throughout the shift shall be permitted to work more than a ten (10) hour continuous shift in any twenty-four (24) hours.

(8) Access to all company records such as maintenance, repairs, fuels, ventilation, etc., pertaining to the use of the underground diesel equipment shall be made available to representatives of the Kentucky Department for Natural Resources upon request. The mine operator shall keep and make available other pertinent records as prescribed by the Kentucky Department for Natural Resources.

(9) The operation of any diesel machine in any manner or under any condition that does not comply with the requirements of these administrative regulations shall be considered by the department as voiding its approval for underground use.

(10) Terminology used in these administrative regulations is consistent with that of KRS 351.010 and 352.010 unless the context requires otherwise. (CM-Rg-1-1.01-1.13; 1 Ky.R. 168; eff. 12-11-1974; TAm eff. 8-9-2007; Crt eff. 6-27-2018.)